



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,857	02/08/2001	Jinlian Hu	401088	6169
23548	7590	04/19/2004	EXAMINER	
LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960			AZARIAN, SEYED H	
			ART UNIT	PAPER NUMBER
			2625	

DATE MAILED: 04/19/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/778,857

Applicant(s)

HU ET AL.

Examiner

Seyed Azarian

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-6 is/are allowed.
- 6) ☒ Claim(s) 1-3,7 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

RESPONSE TO AMENDMENT

1. Applicant's arguments, filed 1/22/2004, see page 5 through page 7, with respect to the rejection of claims 1-3 and 7-8 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Borchers et al (U.S. patent 5,753,931).

Applicant argues in essence that Shofner does not teach, "parallel light beams from at least two different inclined direction onto a surface of fabric" and that the "parallel lighting beams are integrated in the same housing".

2. However, for this feature, "parallel light beams from at least two different inclined direction onto a surface of fabric" the examiner is using the new reference of Borchers et al (U.S. patent 5,753,931), which teaches projecting a plurality of parallel planes of laser light through a transparent plate onto a surface of various type of object (column 6, lines 38-56), and also housing 101 containing various optical elements (Fig. 1, column 3, lines 1-12).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2625

4. Claims 1-3, and 7-8, are rejected under 35 U.S.C. 103(a) as being unpatentable over Shofner et al (U.S. patent 5,533,145) in view of Borchers et al (U.S. 5,753,931).

Regarding claim 1, Shofner discloses method of three-dimensional measurement, evaluation, and grading of fabric/textile structure/garment appearance using photometric stereo technique (Fig. 8, CCD 132 and 130, (photometric stereo), also Fig. 9, column 9, lines 23-51, evaluation of designed and grating of web);

capturing with the camera different reflected images of the surface of the fabric while the surface of the fabric is illuminated from each of the at least two different inclined direction (Fig. 8, column 2, lines 54-67, two different illumination from two different direction);

analyzing the reflected images captured to derive surface normal gradients based on intensities of light reflected from a number of evenly distributed points on the surface (column 14, line 63 through column 15, line 32, reflect of intensity of light from the surface of web and evaluation, also column 14, lines 16-32, derivative calculation).

However Shofner fails to disclose “shining parallel light beams from at least two different inclined direction onto a surface of the fabric”. On the other hand in the same field photometric stereo technique Borchers teaches a plurality of parallel planes of laser light through a transparent plate onto a surface of object (see abstract and column 6, lines 38-56).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made, to modify Shofner apparatus according to the teaching of Borchers because it provides a plurality of digital data representations corresponding to the plurality of optical images and analyzes the digital data to find images of entities of interest, which can

Art Unit: 2625

easily be implemented in an image device such as digital still or video camera for quality assurance in the textile and improve accuracy.

Regarding claim 2, Shofner fails to disclose, “ shining parallel light beams onto the surface of the fabric from four different direction”. On the other hand in the same field photometric stereo technique Borchers teaches Fig. 2, two lasers 105a and 105b are used to project a plurality of parallel planes of laser light through a transparent plate onto a surface of object of light planes, and two cameras 104a and 104b respectively are coupled to frame grabber as shown in Fig. 1, each laser and corresponding optics elements may generate parallel lines with close or overlapping images on transparent plate (column 4, lines 1-16).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made, to modify Shofner apparatus according to the teaching of Borchers because it provides a plurality of digital data representations corresponding to the plurality of laser lines onto an object surface to determining a shape of the object based on the curvature of the reflected laser lines, which can easily be implemented in an image device such as digital still or photometric stereo technique.

Regarding claim 3, combination of Shofner and Borchers discloses an apparatus for three dimensional dimensional measurement, evaluation, and grading of fabric/textile structure/garment appearance using photometric stereo technique, a digital camera mounted above a piece of fabric means to illuminate the fabric (see claim 1, also column 14, line 63, through column 15, line 29, of Shofner, discloses evaluation of clumps of fibers known as neps, seed coat fragments which consists of both a transmitted and reflected illumination and identification, classification of particles in the cotton web)

Means for analyzing images of the fabric captured by the camera, and a computer programmed to derive value of P and Q from the images captured where P and Q are summations of surface normal gradients for a plurality of evenly distributed points in an X direction and in a Y direction, respectively, on the surface of the fabric (Fig. 10, X and Y direction of surface of web and column 9, lines 33-51, the diffraction grating is designed and focuses eight side-by-side images of each of the stripes, controlled by computer 144).

Regarding claims 7 and 8, it recites similar limitation as claims 1 and 2 are similarly analyzed.

Allowable claims

5. The following is an examiner's statement of reasons for allowance.

In claim 4, allowable due to the analyzing the images captured to derive values of P and Q, where P and Q are summations of surface gradients for a plurality of evenly distributed points in an x direction and in a y direction respectively, calibrating $P + Q$ against a subjective grade analysis of the fabric, and thereafter, using calibrated P and Q and determining the grade of the fabric.

The closest prior art of record (Shofner) teaches continuous two-dimensional monitoring of thin webs of textile material. But Shofner does not teach or suggest the calibrating $P + Q$ against a subjective grade analysis of the fabric, and thereafter, using calibrated P and Q and determining the grade of the fabric.

These key features in combination with other features of the claimed invention are neither taught nor suggested by the art of record.

Thus claims 4, 5 and 6 are allowable.

Conclusion

6. **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (703) 306-5907. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached at (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2625


Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR. Status information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian

Patent Examiner

Group Art Unit 2625

March 30, 2004



BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800